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These amendments were discussed and were satisfactory to the members present, but the amendments could not be adopted, since the by-laws require that amendments presented at one meeting can not be adopted before the next annual meeting.

It was the sentiment of the society to affiliate with the National Association for the Advancement of Agricultural Science when the organization of the latter society was sufficiently advanced to make this possible and desirable.

The society voted to fix a price of one dollar per copy for its annual reports to new members and to educational institutions, and a price of two dollars per copy to non-members.

The officers and members of committees for 1908 were reelected for 1909.

C. P. CLOSE,
Secretary-treasurer

SOCIETIES AND ACADEMIES

THE KANSAS ACADEMY OF SCIENCE

THE forty-first annual meeting of the academy was held in Topeka during holiday week, and was of unusual interest both in the quality and number of papers presented for discussion. The retiring president, E. Haworth, chose for the subject of his address "The Life History of a River," and discussed the cause of floods, and the means of controlling these destructive agencies. A. J. Smith told how the city of Emporia is securing a good water supply from the underflow of the Neosho river. The pure food and drugs law called forth several important papers from Professors Bailey, Sayre, Willard, Zieffe and Jackson. The biologists reported additions made in the past year to the lists of birds, mammals and insects. Professor Dyche contributed important notes of his experience in preserving the skins of mammals. Dr. Williston sent a paper on the "Skull Structure of *Diplocaulus*" with restoration, and C. H. Sternberg, the enthusiastic fossil hunter, gave an account of his last summer's finds in the Laramie beds of Wyoming.

One evening was given to memorial exercises in honor of the late Dr. Francis Huntington Snow, one of the founders of this academy, and for more than forty years connected with the University of Kansas, where he held the office of chancellor for twelve years. One of his earliest colleagues, Professor E. Miller, gave a memorial address, and other members spoke of him as a collector, teacher and contributor to scientific discovery. Another evening session, held in Washburn College, was in

part a social occasion, and was otherwise made interesting by Professor Edmondson giving some excellent stereopticon views illustrating an account of his last summer's trip to Tahiti. Professor Parker gave some fine specimens of bird photography, and Professor Sternberg exhibited some good views of the Laramie beds of Wyoming.

The officers elected for the ensuing year were as follows:

President—F. B. Dains, Topeka.

First Vice-president—J. M. McWharf, Ottawa.

Second Vice-president—A. J. Smith, Emporia.

Treasurer—F. W. Bushong, Lawrence.

Secretary—J. T. Lovewell, Topeka.

Ottawa was selected as place for the next annual meeting.

The following papers were presented:

Papers, illustrated by stereopticon:

"Some Glimpses of Tahiti," by C. F. Edmondson.

"Notes on Photography of Wild Birds," by J. B. Parker.

Chemical and Physical Papers

"Resins in Vanilla Extract," by H. L. Jackson.

"An Examination of Apparatus for a Simple Determination of Carbon Dioxid in Air," by E. H. S. Bailey.

"Sulphites as Preservatives," by Edith A. Goodwin and E. H. S. Bailey.

"The Character of the Mid-continent Petroleum," by F. W. Bushong.

"Fluctuations in the Mineral Contents of the Kaw River," by F. W. Bushong and A. J. Weith.

"The Importance of Pharmacological Methods in Drug Assay," by Adolph Zieffe.

"Suggested Legislation in Regard to the Selling of Cocaine," by H. W. Emerson.

"Enameling Steel," by R. D. Landrum.

"The Relation of Manganese to the Corrosion of Iron," by H. P. Cady.

"Progress of Work in Drug Analysis under Pure Food and Drugs Law," by L. E. Sayre.

"Comments on Analysis of Spices," by L. E. Sayre.

"Study of the Cause of Coal-mine Explosions," by E. Haworth and C. M. Young.

"The Medullary Ray as an Element of Strength in Structural Timber," by F. E. Jones.

"On some Methylene Derivatives," by F. B. Dains.

"Recent Investigations of the Properties of Steam," by P. F. Walker.

"Pelton Water-wheel Test made at the University of Wisconsin in the Summer of 1908," by Chas. I. Corp.

"Some Notes on the Steel-hardening Minerals," by J. C. Cooper.

"A Speculation in Crystallography," by J. E. Todd.

"Economy of Heat in Cooking," by J. T. Lovewell.

"Some Difficulties in Testing Food for Sulphites," by J. T. Willard and C. A. A. Utt.

Geological Papers

"Some Notes on the Olympic Peninsula, Washington," by A. B. Reagan.

"The Formations of the Marion Stage of the Permian," by J. W. Beede.

"Why the Southern Hemisphere is the Principal Water Hemisphere and the Northern the Principal Land Hemisphere," by J. J. Jewett.

"The Drainage of the Kansas Ice Sheet," by J. E. Todd.

"Expedition to the Laramie Beds of Converse County, Wyoming, 1908," by C. H. Sternberg.

"A Study of Certain Features of the Lawrence Shales," by J. A. Yates.

"The Extremities and Skull Structure of *Diplocaulus*, with Restoration," by S. W. Williston.

"The Skull Structure of *Diplocaulus magnicornis* Cope," by R. L. Moodie.

"Carboniferous Quadrupeds of Kansas," by R. L. Moodie.

Biological Papers

"A New Bird for the Kansas List, taken at Lawrence," by L. L. Dyche.

"Supplementary Additions to the List of Kansas Diptera," by E. S. Tucker.

"Weismann's Germ Plasm Hypothesis Untenable," by L. C. Wooster.

"Notes on a Captive *Heloderma*," by B. B. Smyth.

"The Birds of the Olympic Peninsula, Washington," by A. B. Reagan.

"Trees and Shrubs of Kansas," B. B. Smyth.

"Distribution, Natural Enemies and Breeding Habits of the Kansas Pocket Gophers," by T. H. Scheffer.

"The Poison Glands of a Rattlesnake during the Period of Hibernation," by L. L. Dyche.

"Notes on Bats," by Lumina C. R. Smyth.

"The Latest Tests for Gas-forming Bacteria in Water," by W. B. Wilson.

"Additions to the List of Kansas Coleoptera," by W. Knaus.

"Some Notes on Kansas Coleoptera," by W. Knaus.

"Note on the Northern Distribution of *Amblychila cylindriciformis* Say," by W. Knaus.

"Kansas Coleoptera of the Families Colydiidae,

Cucujidae, Cryptophagidae, Mycetophagidae, Dermestidae, Histeridae, Nitidulidae, Lathridiidae, Trogositidae, Parnidae, Heteroceridae, Dasyllidae and Rhipiceridae," by W. Knaus.

"Intercellular Spaces in Plants," by L. A. Kenoyer.

"Some Notes on the Common Mole," by T. H. Scheffer.

"Coccidae of Kansas," by G. A. Dean.

"Notes on Kansas Mammals," by D. E. Lantz.

"Some Interrelations of Protozoa," by C. H. Edmondson.

"List of Insect Types and Co-types in the Collection of the University of Kansas," by C. H. Withington.

"Habits of Parasitic Hymenoptera, II.," by C. H. Withington.

Miscellaneous Papers

"The Importance of having Standard Weights and Measures," by E. F. Stimpson.

"Temporary Industrial Fellowships," by R. E. Duncan.

"Railway Rates from an Engineering Standpoint," by B. F. Dalton.

"The Centenary of Charles Darwin," by A. H. Thompson.

"Estimation of the Relative Value of Feeds," by E. B. Cowgill.

"Further Notes on the Influence of Heredity in Stock-breeding," by I. D. Graham.

"Ups and Downs of our Homes from an Architect's Point of View," by N. P. Nielsen.

"Some Glimpses of Tahiti," by C. H. Edmondson.

"Cancer," by J. M. McWharf.

"The Cause and Prevention of Tuberculosis," by S. C. Emley.

"An Improved Water-supply for the City of Emporia," by A. J. Smith.

"A Speculation in Crystallography," by J. E. Todd.

"Indian Remains in the Canadian River Valley," by T. L. Eyerly.

"Notes on Photography of Wild Birds," by J. B. Parker.

"A New Geometrical Figure and its Possible Application," by E. C. Warfel.

"Preliminary Note on Measuring the Speed of Photographic Shutters," by H. I. Woods.

"Views and Notes from Utah," by I. D. Cardiff.

THE ASSOCIATION OF TEACHERS OF MATHEMATICS IN THE MIDDLE STATES AND MARYLAND

The eleventh meeting of the Association of

Teachers of Mathematics in the Middle States and Maryland was held at Franklin and Marshall College, Lancaster, Pa., on November 28. After the address of welcome by President Stahr, the following papers were read:

"Training versus Facts," by William Henry Metzler, Syracuse University.

"Elementary Logic as a Basis for Plane Geometry," by Eugene Randolph Smith, Polytechnic Preparatory School, Brooklyn, N. Y.

"The International Commission on the Teaching of Mathematics," by David Eugene Smith, Teachers College, New York City.

"Checks, Their Use and Abuse," by William E. Breckenridge, Stuyvesant High School, New York City.

"Historical Mathematical Material from the East," by Miss Bertha L. Broomell, Teachers College, New York City.

The annual election of officers was held; the officers elected follow:

President—William Henry Maltbie, Woman's College, Baltimore, Md.

Vice-president—William E. Breckenridge, Stuyvesant High School, New York City.

Secretary—Eugene Randolph Smith, Polytechnic Preparatory School, Brooklyn, N. Y.

Treasurer—Emma Hazleton Carroll, High School for Girls, Philadelphia, Pa.

Members of the Council—William H. Metzler, Syracuse University; Susan C. Lodge, Philadelphia Collegiate Institute for Girls.

The council appointed ten delegates to the American Federation, a committee on publication, composed of William H. Metzler, *chairman*, Eugene R. Smith, Jonathan T. Rorer, and a committee on mathematical work in continuation schools, having as chairman William E. Breckenridge.

The following amendment to the constitution was recommended by the council:

Paragraph I. of Section II., to read:

"The annual meeting shall be held at a time and place to be selected by the council."

The spring meeting of the association will be held at Syracuse University on Easter Saturday.

EUGENE R. SMITH,
Secretary.

THE BIOLOGICAL SOCIETY OF WASHINGTON

THE 452d meeting was held January 9, 1909, with President Palmer in the chair. The following papers were presented:

The Type of the Genus Cactus: J. N. ROSE.

Present Status of the Cotton Boll Weevil: W. D. HUNTER.

The speaker discussed especially two of the most important biological questions that have arisen on account of the invasion of the cotton belt by the boll weevil. These questions are, first, the extent to which the insect is capable of adapting itself to the conditions of this country which are radically different from those of the original home, and, second, the effect on the indigenous fauna in this country.

The wide variation in rainfall, geological formation and other respects in areas that have been invaded was described. The rainfall varies from 12 to 50 inches; the elevation from sea level to 2,500 feet, the absolute minimum temperature from -20° F. to $+20^{\circ}$ F. These variations have caused distinct agricultural provinces to arise, and, indeed, have been so important that they have had an effect towards establishing races of men. The weevil has maintained itself in all this region, but has been most affected by dryness. The cotton plant has an advantage over the weevil in this respect, which indicates that cotton production in western Texas is certain to increase enormously. It is not too much to suppose that the increase in that quarter will offset the falling off in other parts of the belt.

The boll weevil has had very important effects upon the local insect fauna. A number of parasitic and predaceous insects have changed from the original indigenous hosts to the immigrant. Eight predaceous forms attack the adult, 15 similar forms attack the larva, 24 hymenopterous parasites also attack the larva. These parasites also attack 48 species of weevils. The boll weevil complex, therefore, comprises 49 weevils which feed upon 95 plants and 97 insect enemies of these weevils. The interrelationship is so intimate that a factor that will affect any one of the 95 plants in the complex may react upon the boll weevil.

It was pointed out that the boll weevil problem has recently taken on entirely new aspects in the Mississippi Valley. The heavy precipitation, abundance of timber and poor drainage have caused the problem to be much more serious than it was in Texas. This has been shown during the season of 1908 by a great falling off in the production of cotton in Louisiana and the infested portion of Mississippi.

The best hope for the future is in the insect enemies of the weevil. The climatic conditions in Texas that have checked the weevil have also checked the parasites. With the removal of these

checks in the Mississippi Valley it is supposed that the efficiency of the parasites will be proportionately much greater than it has been elsewhere. Practical experiments have been conducted which show that the artificial introduction of parasites that have adopted themselves to the boll weevil in Texas is a hopeful line of assistance to the cotton planter.

Investigations of Toxoptera graminum and its Parasites: by F. M. WEBSTER.

This is a species of aphid which on account of its depredations has come to be known in the grain-growing sections of the southeast and southwest as the green bug. Invasions occur at irregular intervals both in this country and in Europe, when it breeds in immense swarms, not only proving exceedingly destructive, but the winged insects flying or drifting about in clouds, sometimes becoming troublesome to people.

It is known to occur in southern Europe, Hungary, Belgium, in Siberia and in the Orange River Colony, South Africa. In the United States it extends from Mexico and the Gulf northward to Canada, excepting in the central New England states. It also occurs on the Pacific coast. It inhabits elevations of only a few feet above the sea level to the high plateaus of the west at an elevation of eight thousand feet.

While preferring grain, especially oats, it breeds on the following grasses: *Poa pratensis*, which is a common food plant all over the north; *Alopecurus geniculatus*, *Agropyron occidentale* and *Hordeum pusillum* in Oklahoma, Kansas and Colorado; *Agropyron tenerum*, *Bromus portei*, *Elymus striatus*, *Hordeum cæspitosum*, *Polypogon monspeliensis* and *Stipa vividula* in New Mexico; *Distichlis spicata* and *Hordeum jubatum* in Montana; *Setaria glauca* in Indiana; and *Dactylis glomeratus* in the northern states and Virginia. In the northern section of the country 'its principal food plant seems to be blue grass.

Its destructive outbreaks in the United States seem to be regulated by the mild winters and cold springs, not so much on account of the influence of temperature upon the insect itself as upon its principal parasite *Lysiphlebus tritici* which ordinarily holds it in check. Wintering over in the north in the egg stage; in the central portion of the country as far south at least as Tennessee and southern Kansas, both in the egg and as viviparous females; and as the male and sexual female of *Toxoptera graminum* may also occur in the spring, it seems quite possible that in the far south, in the region of the Rio Grande River, this aphid may

pass the dry season instead of the winter in the egg stage, although this has not yet been proved. While the egg-laying female is quite distinct from the viviparous female, individuals frequently occur that are both oviparous and viviparous. The oviparous female produces very few eggs, probably not to exceed a half dozen. The young hatching from these eggs are all of them viviparous females and in the north these continue to remain viviparous until fall and sometimes even through the entire winter.

The principal parasite, *Lysiphlebus tritici*, is parthenogenetic, the offspring of virgin females being usually all males. Occasionally there are females, and these being kept virgin have produced an occasional female to the third generation from the mated female. These parasites deposit their eggs singly in the body of the *Toxoptera*, and the larva when it becomes full grown lines the now empty body of its host with silken threads and attaches the cocoon to the leaf of the plant. These cocoons cause the body of the host to assume a rotund appearance and brownish color and where the insect is excessively abundant and the parasites increasing rapidly these brown bodies become so thick as to give a field of wheat or oats observed at a distance a brownish tinge.

Other insect enemies are the lady beetles, Coccinellidæ, a minute *Aphelinus* and probably a larva of a small fly belonging to the genus *Leucopsis*.

M. C. MARSH,
Recording Secretary

THE NEW YORK ACADEMY OF SCIENCES. SECTION OF ASTRONOMY, PHYSICS AND CHEMISTRY

AT a meeting held at the Museum of Natural History, on Monday, January 18, Dr. O. W. Willcox presented a paper entitled "Cylindrogenite, a Possible Representative of a Cylindrical (Non-Hauyan) Order of Crystals," in which he described a remarkable new form of limonite which occurs in the Red Bank sand of the Upper Cretaceous of New Jersey. The limonite, var. Cylindrogenite, occurs normally as perfect cylinders (which may be either hollow or solid), terminated at either end by a cone or a hemisphere. Two or more cylinders frequently intergrow, forming aggregates in which each cylinder preserves the alignment of its own axis; a number of such aggregates and also a number of photographs were exhibited. A most careful and painstaking study extending over more than three years having failed to suggest any other possible origin for these

objects, Dr. Willcox makes the novel suggestion that they are representatives of a non-Hauyan order of crystals, which he proposes to call the cylindrical system, as distinguished from the cubical and other systems of the Hauyan order. The speaker pointed out that there are no *a priori* reasons for regarding the Hauyan order as the sole mode of expression of crystalline nature; he knew of no reason why nature should be regarded as impotent to fashion a crystal after the form of a cylinder as well as after the form of a cube. As the facts indicate that the cylinders were formed by molecules of dissolved matter in the act of separating from solution to constitute the solid phase, and in so doing assumed a geometrical form of consistent regularity, they are as much entitled to be regarded as crystals as are the cubes which are formed when sodium chloride separates from solution. The cylinder being a geometrical form of higher symmetry than the cube, the absence of distinguishing crystallographic characters as seen under the microscope would be accounted for; and hence a crystallographic investigation shows nothing out of the ordinary.

Professor D. W. Hering read a paper on "Orthopedic Photography, Notes on the Rectification of Distorted Pictures." The paper discussed the defects common in kodak pictures, which arise from badly timed exposure in various conditions of light, followed by development of a whole set of films at once, resulting in excessive inequalities of light and shade. In printing from such a negative, if the source of light is small, as a gas flame or incandescent bulb, these faults can be corrected to a great extent by holding the printing frame in such a position that the distance to different parts of the negative gives different intensity of illumination, and the subsequent development of the print is normal. It also considered the distortion of pictures arising from using a short focus lens, and holding the camera at an awkward angle, as, for instance, pointing it upward or downward at a considerable inclination. By re-photographing the distorted picture, placing it before the camera at an angle to the axis of the lens, a counter distortion is effected which under judicious management rectifies the picture and sometimes improves it. The discussion was directed entirely to correction of defects by physical treatment instead of chemical. Numerous lantern slides illustrated the various stages of these corrective processes.

Professor W. Campbell read "Some Notes on Western Smelters." A series of lantern slides intended to show the evolution of the western

lead smelters on account of changes in conditions and improvements in practice. A photograph of the Globe Smelter, Denver, showed the location of the main buildings. A plan of the plant showed the receiving tracks, bins for fuel, fluxes and ore, the beds, the various roasters, the blast-furnaces and the matte settling reverberatories, flues, bag-house, the old refinery, etc. A tree of smelting showed the course of the materials. Other slides showed the handling of raw materials, the methods of bedding at different plants; of roasting, briquetting of fines; the blast-furnace, types, methods of charging, tapping of lead, of matte and slag, the separation of the same, handling of fowl slag, etc. Level versus sloping sites shown by contrasting photographs of the Murray plant with those of the Leadville, Eilers, Pueblo, etc. Two copper smelters were described: the Highland Boy at Bingham, with 20 McDougall and 3 Wethey roasters, 9 reverberatory smelters and 4 converter stands; the Garfield plant, with 2 blast-furnaces and 3 reverberatory smelters, 4 converter stands, the oxide and sulphide mills, beds, roasters, the Huntington-Herberlein equipment for roasting fine concentrates, etc.

W. CAMPBELL,
Secretary

COLUMBIA UNIVERSITY,
NEW YORK CITY

SECTION OF GEOLOGY AND MINERALOGY

At the regular meeting of December 7, 1908, the evening was devoted to the conditions and problems that have developed by tunneling the Hudson River gorge. Many engineers directly concerned in these enterprises or related ones were present and joined in the discussion.

The following three papers were read summarizing the accumulated data and suggesting the history and structure indicated by them.

"Our Knowledge of the Filled Channel of the Hudson in the Highlands and the Submerged Gorge on the Continental Shelf," by Professor J. F. Kemp. It was shown that the depth now known, over 650 feet, at Storm King Mountain, 50 miles above New York, is greater than at any other point in the whole drainage system except far out on the continental shelf.

"A Summary of an Investigation into the Structural Geology of Southern Manhattan and the Condition of the East River Channel," by Dr. Charles P. Berkey. The results of identification of material recovered from 300 drill borings in southern Manhattan and the adjacent channels

were shown. In this area there are no rock outcrops and nothing is known of bed rock type or condition except what can be determined in this way. It is now certain, however, that the southern end of the island is not wholly underlain by Manhattan schist as formerly mapped, but that the east side is made up of the usual succession of folded Fordham gneiss, Inwood limestone and Manhattan schist.

"Some of the Latest Results of Explorations in the Hudson River at New York City," by Dr. E. O. Hovey. Borings made by the Pennsylvania Tunnel Company across the Hudson on the line of Thirty-second Street were shown and interpreted. Bed rock has been penetrated at three points in the gorge proper. All are approximately 300 feet deep to rock. But since these holes are nearly 1,200 feet apart, the interesting question of a possible narrow inner gorge still remains. Seeing that the proved depth in the Highlands is at least 350 feet deeper than is yet found at New York City, the Hudson problem may still be considered an open one.

CHARLES P. BERKEY,
Secretary of Section

THE AMERICAN CHEMICAL SOCIETY
NORTHEASTERN SECTION

The eighty-eighth regular meeting of the section was held on December 18, at the Chemical Laboratory of Harvard College, Cambridge. An address upon "The Systematic Relations of the Compressibilities of Elements and Simple Compounds" was delivered by Professor Theodore W. Richards, of Harvard University. The speaker called attention to probable relationships between the compressibilities of the elements, the changes of atomic volumes upon the formation of compounds, and the chemical affinities as measured by heats of reaction. After pointing out the lack of reliable data concerning the compressibility of substances, he described the apparatus in use by himself for the determination of this constant and stated that values for the compressibility of thirty-five elements and a number of compounds had already been obtained. It was shown that the compressibility is a periodic function of the elements and that the relationships with atomic volumes and heats of reaction are in remarkable agreement with the predictions. Some striking relationships among organic compounds were cited and it was stated that further work is being done upon the study of isomers.

Professor Bertram B. Boltwood, of Yale Univer-

sity, briefly described the recent work of Professor Rutherford upon the "α rays."

THE eighty-ninth regular meeting of the section was held at the Massachusetts Institute of Technology on January 22. The following papers were presented: "Fundamental Principles underlying the Decay of Structural Materials," by Professor W. H. Walker, of the Massachusetts Institute of Technology, a concise statement of the electrolytic theory of the corrosion of iron; "Protective Coatings for the Conservation of Structural Materials," by Mr. Robert S. Perry, president of the scientific section of the Paint Manufacture Association of the United States, an account of work being done in testing the porosity and elastic strength of paint skins and the inhibitive or stimulative effect of certain pigments on the rate of corrosion of metals.

KENNETH L. MARK,
Secretary

THE SCIENTIFIC ASSOCIATION OF JOHNS HOPKINS
UNIVERSITY

The association held its monthly meeting January 13, when it was addressed by Professors J. M. Baldwin and J. B. Whitehead.

Professor Baldwin spoke upon the subject of "Genetic Science," classifying sciences as genetic or agenetic. He showed the ground for the distinction between them to be that they are qualitative and quantitative, respectively.

The limitations of quantitative science were pointed out while recent advances in the scientific and philosophical theory of genetic science were discussed. Quantity and quality both represent special points of view, each requiring a certain abstraction and limitation with respect to the actual events of nature. It is the task of philosophy to affect the synthesis which will not disqualify either.

Professor Whitehead discussed the problem of the "Electrification of Steam Railways." Steam railways are being transformed and operated electrically in tunnels in order to secure freedom from gases due to combustion; in terminals to increase traffic capacity, and on through service in order to lessen cost of operation. Coal consumption and cost of repairs are lessened. It was shown that the electrification of all the steam railways of the country would lessen the total consumption of coal of the country about 7 per cent.

C. K. SWARTZ,
Secretary